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(52) UK CL (Edition W):
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(56) Documents Cited:
EP 1319384 A1
WO 2002/025675 A1
ES 002102320 A1
US 5741317 A
US 5334193 A

(58) Field of Search:
UK CL (Edition W) A5R
INT CL[7] A61H, A61N
Other: ONLINE : EPODOC JAPIO WPI

(54) Abstract Title: **Flat spiral electrodes for foot bath**

(57) An electrode assembly for a foot bath is formed from two parallel disposed stainless steel rods 1 and 2 forming formed together into a flat pancake spiral with outside ends 4 and 5 of each rod being bent at a right angle to project outwardly and from opposed sides of the spiral to form connections. The faces of the spiral are encased by fluid permeable perforated plastic plates 6 and 7 to form a sandwich structure. In use the assembly sits over a cavity in the base of a bath to form a floor the cavity side wall having connectors to couple with the electrode connections.

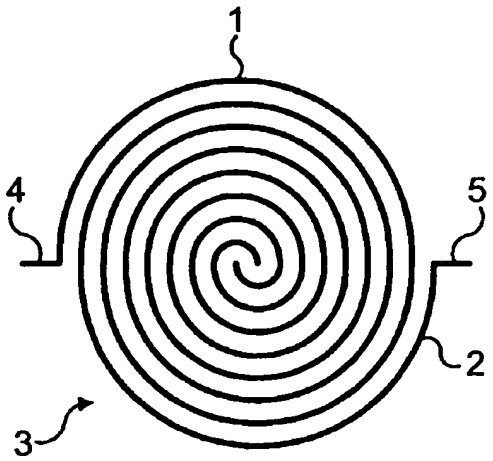

FIG. 1b

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

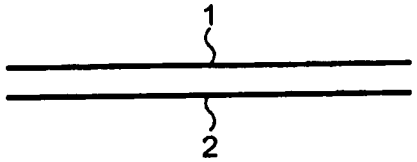

FIG. 1a

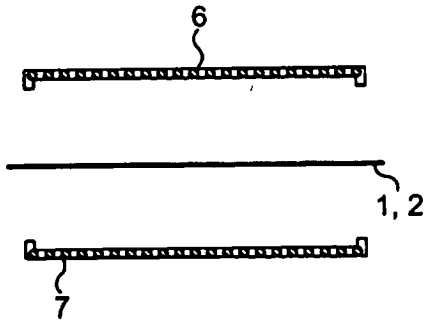

FIG. 1c

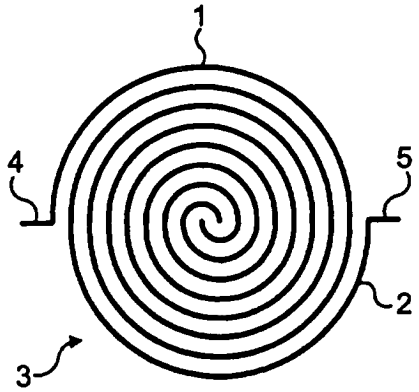

FIG. 1b

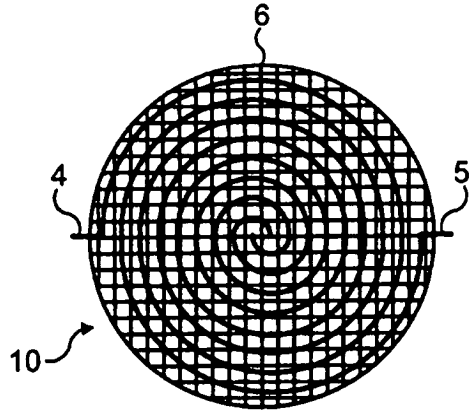

FIG. 1d

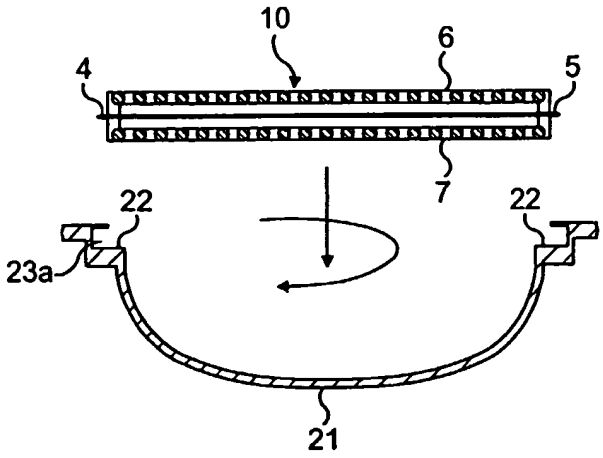

FIG. 2a

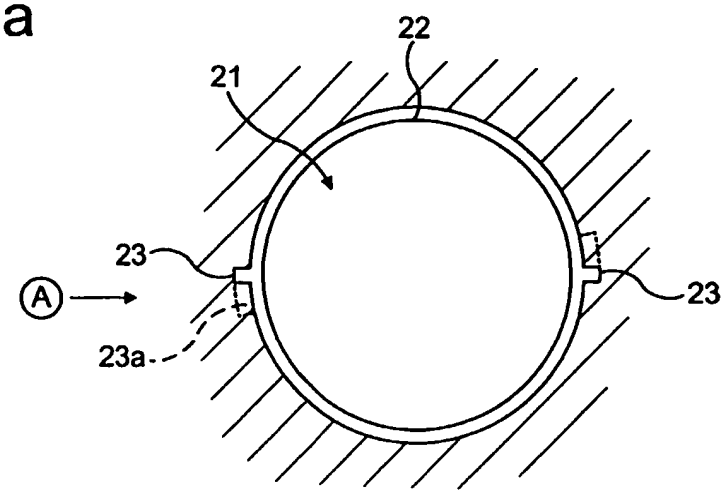

FIG. 2b

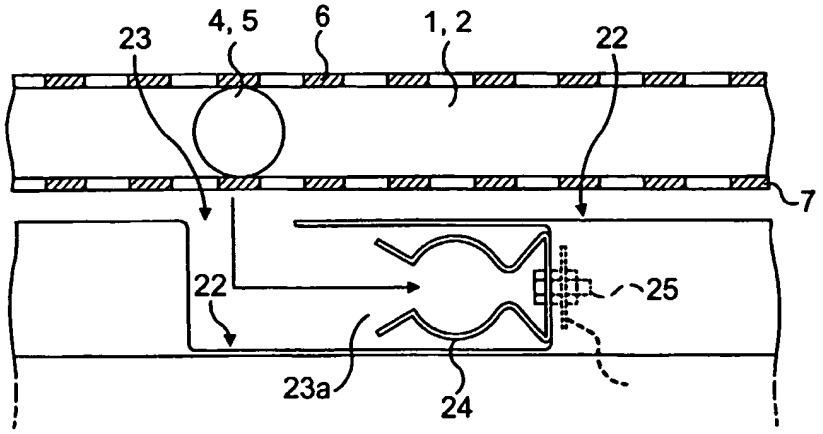

FIG. 2c

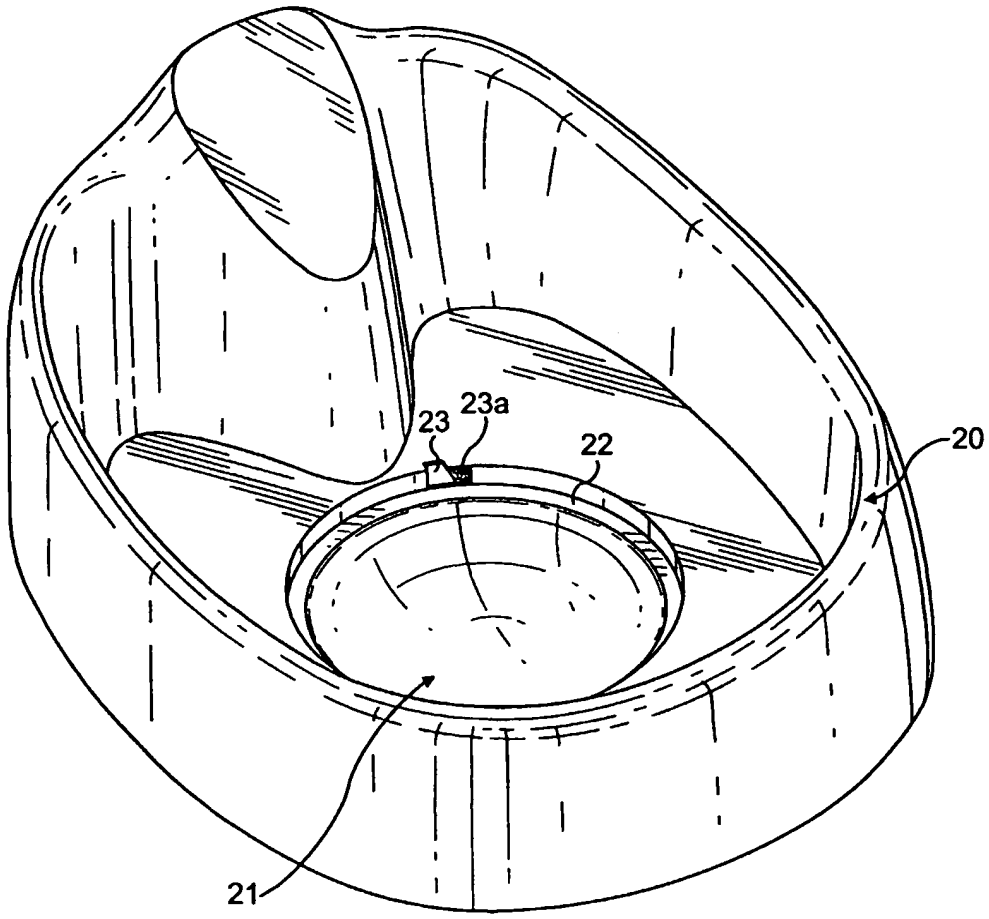

FIG. 3

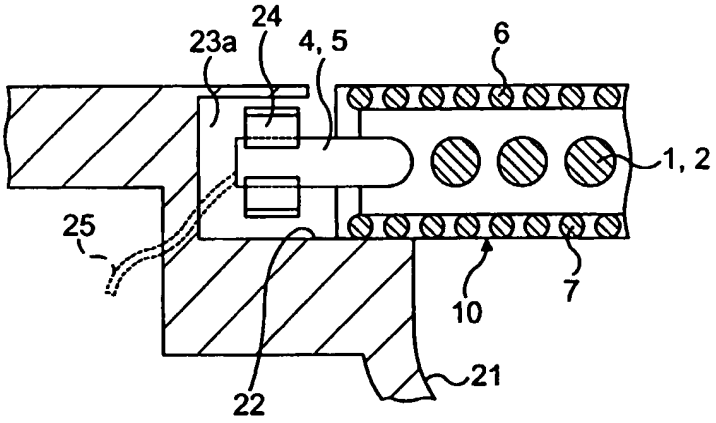

FIG. 4

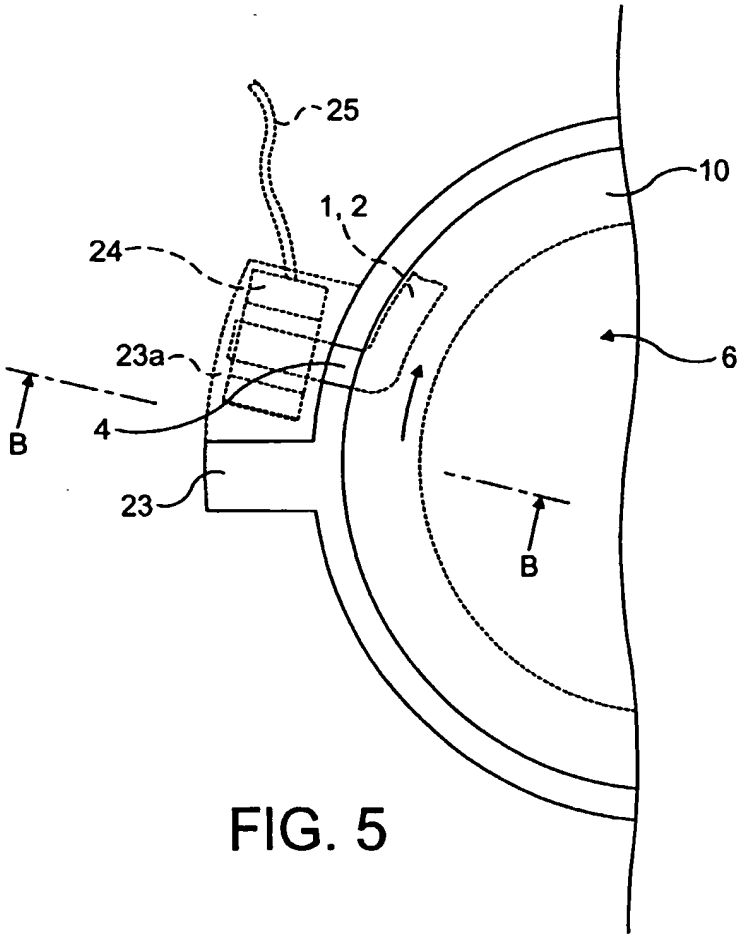

FIG. 5

Title:

Electrodes for therapeutic apparatus.

This invention relates to electrode assemblies for use in therapeutic apparatus and to such an apparatus incorporating the electrodes. The apparatus to which this invention relates may comprise a fluid containing bowl or bath into which a user immerses a part of the body, for example the feet, with an electrode assembly in effective contact with the fluid. The electrode assembly induces an electric and/or a magnetic field in the fluid, usually water, and provides a therapeutic or a cleansing action on the immersed part of the body.

According to one aspect of this invention there is provided an electrode assembly for use in a therapeutic apparatus the assembly comprising:

a) a first electrode rod,

b) a second electrode rod positioned in spaced parallel relationship with the first electrode rod,

c) the first and second electrode rods together being configured to form a flat spiral element preferably with both rods lying in the plane of the spiral,

d) a connection to each rod being located on the outside of the spiral and preferably mutually opposed at each side of a diameter,

e) fluid permeable insulating plates co-planar with the spiral element and located one at each side of the element to form a sandwich

structure.

According to a second aspect of this invention there is also provided a therapeutic apparatus comprising a fluid containing bath, a cavity in the base of the bath, a pair of electrical contacts associated with and preferably located at opposed sides of the cavity, the open side of the cavity being covered by the electrode assembly of the first aspect of this invention which thus forms a floor of the bath, the connections to the rods each engage an aforesaid electrical contact, the cavity having fluid tight electrical connections between the said contacts and a source of electrical power preferably located in the base structure of the bath.

This invention is described further and in more detail with reference to an embodiment shown by way of example in the drawings. In the drawings:

Fig. 1a-d shows the step-by-step construction of the electrode assembly of this invention,

Fig. 2a shows a side sectional view through the cavity part of a therapeutic bath with the electrode assembly being fitted into place,

Fig. 2b shows a plan view of the cavity with the electrode assembly in position,

Fig. 3 shows an embodiment of therapeutic bath illustrating the cavity or sump area and before the electrode assembly is put in place,

Fig. 4 Is a detail side sectional view on B-B of Fig. 5 and showing

one electrical connection of the electrode end to the cavity wall connector, and

Fig. 5 is a plan deatil view of the cavity showing one of the electrode connections as shown in Fig. 4 in section.

Referring to Fig. 1a there is shown two parallel disposed stainless steel rods 1 and 2 forming electrodes. The rods 1 and 2 are formed together into a flat pancake spiral 3 as shown at Fig 1b with outside ends 4 and 5 of each rod being bent at a right angle to project outwardly and from opposed sides of the spiral to form connections. The faces of the spiral are encased by fluid permeable perforated plastic plates 6 and 7 to form a sandwich structure as shown in side view in Fig. 1c and in plan view in Fig. 1d. The view of Fig. 1c shows the plates 6 and 7 spaced for clarity. Connections are provided (not shown) whereby the plates are secured to the electrodes for example fasteners or snap connections may be used to form an integral electrode assembly 10.

The connections 4 and 5 project laterally from the periphery of the plates 6 and 7 and at diametrically opposed locations.

Referring to Figs. 2 and 3 a foot bath 20 (Fig. 3) has a cavity or sump part 21, as shown in section in Fig. 2a, which may be closed by the electrode assembly 10 which is dropped down over the cavity with the assembly resting against, and supported on, a peripheral shoulder 22 of the cavity. The cavity is shown in plan view at Fig 2b.

The side detail view at Fig. 2c shows the L-shaped slots 23 which are provided at diametrically opposed locations adjacent the shoulder 22 and looking in the direction A as shown in Fig. 2b. The slots permit vertical entry of

the connections 4 and 5 which may thus drop down into the slots to allow the electrode assembly to sit on the shoulder 22 overlying the top of the cavity. By rotating the electrode element assembly, anti-clockwise as shown in Fig. 2b, the connections 4 and 5 move horizontally along channels 23a which are fed by the slots, to engage electrical connectors 24 located in the rim of the cavity. The connectors 24 have a fluid tight connection to terminals 25 outside the confines of the cavity and within the base of the bath 20 which is a dry area for containing the operative electrical or electronic therapy apparatus connected to the terminals and thus the electrodes 4 and 5.

Fig 4 shows one slot in more detail as a fragmentary side sectional view on B-B of Fig. 5, and Fig. 5 shows the slot as seen in plan view from above. Figs 4 and 5 show an arrangement where the assembly is rotated clockwise to secure the element ends 4 and 5 into the connectors 24.

An alternative construction (not shown) has a second shoulder located below the shoulder 22 and in this case the shoulder 22 has the electrode end entrance slots and the second shoulder supports the electrode assembly.

This arrangement and configuration of the electrodes allows simple removal of the complete assembly 10 for cleaning or replacement and provides a structure through which the fluid medium may easily circulate whilst preventing direct contact with the body of a user.

A feature of this invention is the combination of the bath 20 with the cavity 21 which is adapted to receive the electrode assembly 10 with the assembly being both mechanically retained and electrically connected by a simply locating the assembly in the slots 23 and then rotating to effect the

engagement with the electrical contacts by a turning action also serving also to lock the assembly in position.

CLAIMS:

1. An electrode assembly for use in a therapeutic apparatus the assembly comprising:

a) a first electrode rod,

b) a second electrode rod positioned in spaced parallel relationship with the first electrode rod,

c) the first and second electrode rods together being configured to form a spiral element,

d) a connection to each rod being located on the outside of the spiral and preferably mutually opposed at each side of a diameter,

e) fluid permeable insulating plates co-planar with the spiral element and located one at each side of the element to form a sandwich structure.

2. An electrode assembly according to claim 1, wherein the spiral element is flat and both the rods lie in the plane of the spiral.

3. An electrode assembly according to claim 1 or 2, wherein the connection to each rod is located on the outside of the spiral and mutually opposed at each side of a diameter.

4. An electrode assembly according to any preceding claim, wherein the fluid permeable plates are of an open mesh plastics material with reinforcement ribs, the plates having clip means to attach to , and support, the electrodes.

5. An electrode assembly according to claim 4, wherein the plates include concentric ribs, an outer most rib forming a supporting rim.

6. A therapeutic apparatus comprising a fluid containing bath, a cavity in the base of the bath, a pair of electrical contacts associated with and preferably located at opposed sides of the cavity, the open side of the cavity being covered by the electrode assembly of any preceding claim, whereby the connections to the rods each engage an aforesaid electrical contact, the cavity having fluid tight electrical connections between the said contacts and a source of electrical power.

7. An apparatus according to claim 6, wherein the pair of electrical contacts are located at opposed sides of the cavity.

8. An apparatus according to claim 6 or 7, wherein the cavity is located in a base of the bath and includes a peripheral ledge on which the electrode assembly rests.

9. An apparatus according to claim 6, wherein the ledge is defined by an upstanding bounding wall around the cavity, the wall having entrance slots to receive the ends of the electrodes, the slots having the electrical contacts to engage the electrode rod ends.

10. An electrode assembly as described herein and exemplified with reference to the drawings.

11. A therapeutic apparatus, particularly a foot bath, as described herein and exemplified with reference to the drawings.

Application No:	GB 0323987.8	**Examiner:**	Gareth Lewis
Claims searched:	1 at least	**Date of search:**	16 February 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
A	-	US 5741317	(OSTROW) See abstract and figures 1,3 and 5
A	-	US 5334193	(NARDELLA) See abstract and figure 2
A	-	EP 1319384 A1	(SANYO) See abstract and figures 1 and 8
A	-	WO 02/25675 A1	(HAVEL) See Derwent English abstract acc. no. 2002-341337 [38] and figures
A	-	ES 2102320 A1	(AHECHU)See Derwent English abstract acc. no. 1997-375256 [35] and figures

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[W]:

A5R

Worldwide search of patent documents classified in the following areas of the IPC[7]:

A61N A61H

The following online and other databases have been used in the preparation of this search report:

Online : WPI JAPIO EPODOC